

REMARKS

The March 12, 2009, Office Action and the references cited therein have been considered. In view of the amendments presented herewith and the following remarks, favorable reconsideration and allowance of this application are respectfully requested.

Claims 1 and 3-16 are currently pending. Claims 6-11 stand withdrawn. Claims 1, 3 and 16 are amended herein. Claim 4 is cancelled without prejudice or disclaimer as to the subject matter therein. New claims 17 and 18 are presented for entry and examination. Following entry of the claim amendments, new claims and response, claims 1, 3, and 5-18 will be pending. Applicant respectfully reserves the right to prosecute the subject matter of the cancelled claim in one or more continuation or divisional applications. Support for the amended and new claims can be found throughout the application as originally filed, *inter alia*, on page 6, lines 25-30; page 10, lines 22-31; claims 3 and 4 as originally filed, and figures 2-7. Therefore, Applicant submits that no new matter is introduced into the application by way of the instant claim amendments.

Rejections Under 35 U.S.C. § 112, 1st Paragraph

Claims 3 and 16 were rejected under 35 U.S.C. § 112, 1st paragraph as allegedly lacking enablement. Applicants have amended claims 3 and 16 herein to address the enablement rejection, and respectfully request reconsideration and withdrawal of the enablement rejection in light of the claim amendments presented in claims 3 and 16.

Rejections Under 35 U.S.C. § 103(a)

Claims 1, 3-5 and 12-16 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Proffitt *et al.* (U.S. Patent No. 5,415,024) in view of "AAPA".

Applicants respectfully disagree and traverse this rejection.

Under 35 U.S.C. § 103, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988). There are four separate factual inquiries to consider in making an obviousness determination: (1) the scope and content

of the prior art; (2) the level of ordinary skill in the field of the invention; (3) the differences between the claimed invention and the prior art; and (4) the existence of any objective evidence, or “secondary considerations,” of non-obviousness. Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966); *see also* KSR Int’l Co. v. Teleflex Inc., 127 S. Ct. 1727 (2007).

An “expansive and flexible approach” should be applied when determining obviousness based on a combination of prior art references. KSR, 127 S. Ct. at 1739. However, a claimed invention combining multiple known elements is not rendered obvious simply because each element was known independently in the prior art. Id. at 1741. Rather, a “reason” must be set forth for reaching a *prima facie* obviousness determination. Takeda Chemical Indus., Ltd. v. Alphapharm, 492 F.3d 1350, 1356-1357, 83 U.S.P.Q.2d 1169, 1174 (Fed. Cir. 2007). In particular, “[i]t remains necessary to show ‘some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness,’” Aventis Pharma Deutschland GmbH v. Lupin Ltd., 499 F.3d 1293, 84 USPQ2d 1197, 1204 (Fed. Cir. 2007). Also, modification of a prior art reference may be obvious only if there exists a reason that would have prompted a person of ordinary skill to make the change. KSR, 127 S. Ct. at 1740-41.

Applicants respectfully submit that the claimed invention is not rendered obvious by the cited references, alone or in combination. Applicants submit that Proffitt discloses a “... method of use for determining the composition and/or individual component flow rate in a three-component fluid system containing two liquids and a gas or a liquid, a solid and a gas or two solids and a gas.” *See* Proffitt, “Field of the Invention”. Applicants submit that Proffitt does not disclose a “... method of measuring mass flow of a first gas component in a gas consisting of two or more known gas components ...” (i.e. a composition comprising only gasses), as required by amended claim 1. Applicants submit that Proffitt thus discloses a method that may be useful within measuring components in liquid or liquid/solid systems, but not in pure gas systems.

It is stated in the Office Action that Proffitt discloses “... continuously determining the temperature and pressure ... (col. 4: 20-25) ...” *See* Office Action, page 3. Column 4, lines 20-25 of Proffitt reads: “The apparatus described is used to measure the energy input, the heat loss from the apparatus, the temperatures in and out, the flow rates in and out and pressure changes in and out of a multiphase fluid. These values are then used to determine the composition of the

multiphase fluid through application of the ideal gas laws or some modification thereof and thermodynamic principles.” There is no mention of continuous of the mentioned features. On the contrary, Proffitt sees a disadvantage in continuous measuring. *See* Proffitt, col. 1, lines 36-41.

It is further argued in the Office Action that Proffitt discloses “determining the mass flow of one gas component ... by using the determined temperature, pressure, and the percent volume of the gas (col. 4: 26-46)”. *See* Office Action, page 4. Column 4, lines 21-46 of Proffitt reads:

The apparatus described is used to *measure the energy input, the heat loss from the apparatus, the temperatures in and out, the flow rates in and out and pressure changes in and out of a multiphase fluid*. These values are then used to determine the composition of the multiphase fluid through application of the ideal gas laws or some modification thereof and thermodynamic principles. As stated previously, the invention makes use of the fact that changes in temperature and pressure in a multiphase fluid produce a much greater percentage change to the gas volume than to the liquid and/or solid volume. *By measuring the in and out fluid temperatures, pressures and flow rates, and inside and outside insulation temperatures as a result of adding a measured quantity of energy to the conduit, approximations of the volume of gas and liquid in the system can be made*. The final determination of the system composition can be accurately calculated through an iteration process as explained in detail below. In accordance with the invention, the observed data (F_{Qi} , F_{Qo} , T_i , T_o , T_1 , T_2 , P_1 , P_2 and q) are recorded instantaneously and simultaneously at any point in time. These data and other data and relationships required by the method are used to determine the flows and/or masses of the components as described below.

See Proffitt, col. 4, ll. 21-46 (emphasis added). Thus, Proffitt discloses measurement of temperature, the overall flow and the pressure change. Proffitt then discloses “... determination of the system composition can be accurately calculated ...”. Applicants submit that Proffitt does not disclose “... a volume percentage measurement instrument (440; 540; 640) arranged to measure the volume percentage of at least the first gas component in the gas in order to determine the gas composition for use in the determination of the mass flow of the first gas component ...”, as required in the currently amended claim 1.

Applicants submit that Proffitt determines the volume of a gas by calculation from the ideal gas law. Moreover, the volume of gas determined by Proffitt is the ratio of gas within a composition comprising one or more other phases (viz. solid, liquid); the volume of gas

determined in Proffitt is thus not the measurement of a first gas component within a gas having two or more gas components. The method of the present invention allows a precise and continuous determination of the mass flow of a gas component based on a measured volume percentage of the gas component, even if the gas has more than two gas components.

The Office Action refers to page 10, line 24 extending to page 11, line 1 as Applicant's admitted prior art. Applicants submit that the cited phrase is placed in the part of the application describing various embodiments of the invention, and is not placed in a part of the application describing prior art. The cited passage is describing calculations made in the context of the description of the method and the apparatus according to the claimed invention as a whole. Therefore, Applicants respectfully disagree that the cited calculation can be termed "admitted prior art" in connection with the invention. However, even if the calculation itself is known, Applicants note that the calculation itself does not provide direction toward the claimed method. Applicants submit that Proffitt does not teach or suggest the claimed invention, and does not render the claimed invention obvious alone or in combination with other references.

Proffitt, as described above, discloses a method and apparatus related to a different problem, viz. the problem of determining the ratio of fluids in a multiphase fluid system, where the composition of the gas phase is not analyzed at all. It is intended for use in the petroleum industry. Therefore, a person skilled in the art would not have an incentive to analyze Proffitt, when finding solutions in the field of gas component analysis. Further, by combining the features of the calculation and the disclosure by Proffitt, the person skilled in the art could not arrive at the present invention, since neither the calculation in itself implies or suggests measurement of volume percentage flow, nor does Proffitt suggest this feature. Thus, the feature of measuring the volume percentage is absent from the cited prior art, and consequently there is no incentive for a person skilled in the art to amend the method of Proffitt. Similar considerations apply to the claims depending from claim 1.

CONCLUSION

In view of the foregoing, Applicants respectfully request an indication of allowance.

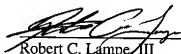
If the Examiner has any questions relating to this response, or the application in general, the Examiner is respectfully requested to contact the undersigned so that prosecution of this application may be expedited.

Respectfully submitted,

HUNTON & WILLIAMS LLP

Dated: September 14, 2009

By:


Robert C. Lampe III
Reg. No. 51,914

HUNTON & WILLIAMS LLP
Intellectual Property Department
1900 K Street, N.W., Suite 1200
Washington, DC 20006-1109
(202) 955-1500 (telephone)
(202) 778-2201 (facsimile)